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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,513	10/19/2001	William L. Detore	TY2002US	3091

27410 7590 06/16/2004

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EXAMINER

JOHNSON, VICKY A

ART UNIT	PAPER NUMBER
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3682

DATE MAILED: 06/16/2004

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Paper No. 20040610

Application Number: 10/035,513
Filing Date: October 19, 2001
Appellant(s): DETORE ET AL.

J. Michael Neary
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed March 24, 2004.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences, which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

A. Claims 1, 5, and 6 have been rejected under 35 USC 112, 2nd ¶.

B. Claims 1, 5 and 7 have been rejected under 35 USC 102 as anticipated by US 6,299,718 to Kimura.

C. Claim 6 was rejected under 35 USC 103 as unpatentable over US 6,299,718 to Kimura.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

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(7) Grouping of Claims

Appellant's brief includes a statement that claims 1 and 5-7 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

6,299,718

Kimura et al

10-2001

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1, 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 5, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 5, and 7 are rejected under 35 U.S.C. 102(a) as being anticipated by Kimura et al (6,299,718).

Kimura et al disclose a hybrid composite flywheel rim comprising: a cylindrical fiber structure (see Fig 2), at least two different types of fibers (col. 3 lines 57-67) impregnated with a thermosetting resin (col. 5 lines 42-53), said two different fibers having different elastic moduli (col. 3 lines 57-67).

Re claim 5, Kimura et al show fibers having different elastic moduli (col. 3 lines 57-67), said fibers including carbon fiber, glass fiber (col. 3 lines 57-67), said fibers fixed in a matrix of thermosetting resin (col. 5 lines 42-53).

Re claim 7, Kimura et al show an annular structure having a plurality of zones (col. 9 lines 4-31), each with multiple fiber layers in a resin matrix (col. 5 lines 42-53), each said fiber layer having a mixture of carbon fiber tows and glass fiber tows at a ratio of tows that is constant in each layer of any single zone (col. 9 lines 4-31), and said ratio incrementally increases zone-by-zone radially toward outside zones of said rim (col. 9 lines 11-30).

The process of forming the device is not germane to the issue of patentability of the device itself. Therefore, the limitations "wound in an annulus on a mandrel", "said fiber is distributed in said cylindrical fiber wound structure as bands of tows, each tow having only a single type of fiber, said tows lying in a lay-up pattern that is defined by the correlation between lead rate per mandrel revolution and winding length to produce a random distribution of the first fiber type amongst the second fiber type

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macroscopically", "wound in a fiber band with a predetermined lead rate into said annular structure", "said predetermined lead rate, in correlation with the winding length, ensures that said carbon fiber tows lie in a macroscopically uniform distribution in each zone", and "carbon fiber tows lie in a macroscopically uniform distribution in each zone by controlling the correlation between lead rate of the fiber band as it is wound onto the mandrel per mandrel revolution and the winding length" has not been given any patentable weight.

Even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). (see also, MPEP 2113).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimura et al (6,299,718).

Kimura et al disclose a hybrid composite flywheel rim as claimed except for the following equation being satisfied: $WL=(N + B/A) \cdot LR$.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the strength of the flywheel, since has been held to be with in the general skill of a worker in the art to achieve optimization through routine experimentation. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Svala*, 70 USPQ 412 (CCPA 1946).

(11) Response to Argument

Claims 1, 5, and 6 have been rejected under 35 USC 112, 2nd paragraph. The applicant argues that “such as” in the phrase “a thermosetting resin such as epoxy resin” in these claims does not make it difficult for a person of ordinary skill in the art to avoid the literal scope of the claim. The term “such as epoxy resin” is indefinite because it makes unclear if “epoxy resin” is being claimed or “thermosetting resin” is being claimed. One having ordinary skill in the art could incorrectly interpret the language to mean that a thermosetting resin with properties similar to epoxy resin is required. The applicant argues that the “such as” phrase gives guidance to the person reading the claim as to the correct interpretation of the general term, but goes on to state that “Resin impregnation of fibers in fiber winding operations is a well understood process.” One having ordinary skill in the art understands the term “thermosetting resin” and does not require an example or guidance in order to correctly interpret the claim language.

It is argued that the Kimura reference fails to meet the limitations of the claims because the Kimura reference fails to disclose a flywheel. The applicant does not claim a flywheel. The applicant claims a flywheel rim, but none of the limitations pertain to a flywheel. The applicant intends the rim to be used on a flywheel, but this is only intended use. Applicant argues that the part disclosed in Kimura is a thick walled cylindrical structural part, but Webster's Dictionary describes a rim as the "the outer often curved or circular edge or border of something." The Kimura reference meets the limitation of being a rim, because there are no limitations in applicant's claims that pertain to the thickness of the rim.

Applicant argues the structural member disclosed in Kimura is not a flywheel rim and could not be used as a flywheel rim. Kimura does not disclose that the structural member is a flywheel rim or any other specific structure. Kimura only states that it is a thick walled structure, but also states in column 11 lines 2-9, that the wall thickness may be larger, and the values in Table 2 are only given as examples. The applicant does not give any limitations pertaining to the thickness of the rim, therefore it cannot be determined if the rim is thicker or thinner than the structural member disclosed in the Kimura reference.

The applicant argues that Kimura fails to meet the limitations of the claims because Kimura fails to disclose a structure wherein the two fiber types are distributed randomly amongst each other. Applicant's specification does not specifically define "random." In the Summary of the Invention it states that the "carbon fiber is macroscopically uniform in each layer," and in paragraph 20 of the specification it states

that "the goal is to wind the fiber band onto the mandrel in such a way the carbon fiber tows lie in a macroscopically uniform distribution in each zone," but in paragraph 37 the specification states that "the carbon fibers and glass fibers are concentrated in these tows, so the distribution of the actual fibers is not uniform or random, but the distribution of the tows is uniform or random." The term "random" when interpreted in light of the specification was determined to mean "not stacked" or "evenly distributed". Figure 5 further supports this interpretation since it shows "uniform or random carbon fiber distribution". Figures 3-5 of the Kimura reference show that the fibers will not be stacked, but cross-hatched as in Figure 3 of the applicant's application. Kimura also states in column 7 lines 12-15 that the glass fiber is laid up between the fiber reinforced plastic composite material at regular intervals, which implies that the one fiber is dispersed evenly between the other fibers and not stacked in vertical rows.

Applicant cites various examples of prior art where language pertaining to methods of forming a device were found in the claims. Although process limitations are not given patentable weight in a product claim, the Office does not require that the language be cancelled from the claim. Method or process limitations may be given patentable weight if it is determined that the process or method imparts some type of structure to the device. The phrase, "wound in an annulus on a mandrel" was not given patentable weight, but it does impart that the device is annularly shaped, which is given patentable weight, but the method of forming the shape is not given patentable weight. Applicant also states "...there are structural limitations inherent in the limitation "wound in an annulus on a mandrel". It implies that the fibers circle the mandrel in a generally

helical circumferential direction in which they can offer the greatest strength in the hoop direction." The phrase "wound in an annulus on a mandrel" does not imply that the fiber is wound in a helical circumferential direction. It only implies that the final structure has an annular or ring shaped structure.

The phrase, "said tows lying in a lay-up pattern that is defined by the correlation between the lead rate per mandrel revolution and the winding length to produce a random distribution of the first fiber type amongst said second fiber type macroscopically" is argued as being, "It is structural definition of the lay-up pattern," which may be true, but it is not a structural limitation of the rim. The lay-up pattern is a process limitation, and has not been given patentable weight, but the "random distribution of the first fiber type amongst said second fiber type macroscopically" has been given patentable weight.

Claim 6 is argued to be patentable because Kimura does not disclose carbon fiber distributed amongst the other fiber in a cross-hatch pattern macroscopically. Figure 3-5 show the tows being wound in a cross-hatch pattern. The specification of Kimura in column 9 lines 4-17 describes the lamination directions as being $\pm 10^\circ$ and $\pm 45^\circ$, for the carbon fibers and $\pm 85^\circ$ for the glass fibers. The different angles of the lamination directions would produce a cross-hatching of the fibers throughout a band.

It is also argued that claim 6 specifies a relationship between the winding length and the lead rate with the following equation: $W_L = (N + B/A) \cdot L_R$. This limitation was rejected as being obvious to one having ordinary skill in the art because it would have been obvious to optimize the strength of the flywheel. It is further argued that one

having ordinary skill in the art would not know to change the lead rate in relation to the winding length to ensure that the fiber tows in the fiber band do not stack radially. The Kimura reference points out that the lamination angles of the carbon fibers and the glass fibers are not the same, and therefore as defined by the applicant the lead rate, or the longitudinal distance between adjacent turns of a band of fiber measured center to center, on a mandrel would change throughout the band. Kimura states that this process will reduce the internal stress, and therefore would increase the overall strength of the member.

The applicant concludes with arguments that the Kimura reference is not analogous art because the claimed structural element "must have good bending strength and bending modulus" and that these features are insignificant in the design of flywheels. Although this may be true it does not preclude the claims of the applicant to be anticipated by the Kimura reference. Applicant reiterates the argument that Kimura does not disclose a random distribution of the fiber types amongst each other, as stated earlier the definition of "random" as used throughout the specification of the applicant was interpreted to mean "not stacked" or "evenly distributed" as shown in applicant's Figure 5.

The applicant broadly claims a cylindrical fiber wound structure having at least two different types of fibers, impregnated with a thermosetting resin, the fibers having different elastic moduli, and the first fibers distributed randomly amongst the second fibers. The Kimura reference meets each and every limitation of the claims, and therefore anticipates applicant's invention.

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Vicky Johnson
June 14, 2004

Conferees

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